

CLAIMS

[1] An electrode carbon material to become a constituent material for an electrode of a nonaqueous electrolyte battery;

wherein the electrode carbon material is formed by way of a plasma processing step of subjecting a material composition to high-frequency thermal plasma processing in a plasma gas atmosphere including a sulfur-containing compound.

[2] An electrode carbon material according to claim 1, wherein the electrode carbon material has a BET specific surface area of 0.5 to 300 m²/g.

[3] An electrode carbon material according to claim 1 or 2, wherein the electrode carbon material contains 0.02 to 6 mass % of sulfur based on the total amount of the electrode carbon material and is used as a constituent material for an anode.

[4] An electrode carbon material according to claim 1 or 2, wherein the electrode carbon material contains 1.2 to 18 mass % of sulfur based on the total amount of the electrode carbon material and is used as a constituent material for a cathode.

[5] An electrode carbon material according to one of claims 1 to 4, wherein the electrode carbon material is capable of inserting and desorbing a lithium ion.

[6] An electrode for a nonaqueous electrolyte battery;
the electrode comprising:

an active material containing layer including the electrode carbon material according to one of claims 1 to 5 and a binder capable of binding the electrode carbon material as constituent materials; and

a conductive collector arranged in a state electrically in contact with the active material containing layer.

[7] A nonaqueous electrolyte battery comprising:

an anode;

5 a cathode; and

an electrolyte layer, arranged between the anode and cathode, including a nonaqueous electrolyte;

wherein at least one of the anode and cathode is the electrode according to claim 6.

10 [8] A nonaqueous electrolyte battery according to claim 7, wherein each of the anode and cathode is the electrode according to claim 6.

[9] A method of manufacturing an electrode carbon material to become a constituent material for an electrode of a nonaqueous electrolyte battery;

15 the method including a plasma processing step of subjecting a material composition to high-frequency thermal plasma processing in a plasma gas atmosphere including a sulfur-containing compound.

[10] A method of manufacturing an electrode for a nonaqueous electrolyte battery;

20 the method including:

a plasma processing step of subjecting a material composition to high-frequency thermal plasma processing in a plasma gas atmosphere including a sulfur-containing compound, so as to yield an electrode carbon material; and

25 an active material containing layer forming step of forming an active material containing layer including the electrode carbon material

and a binder capable of binding the electrode carbon material as constituent materials in a state electrically in contact with a conductive collector.

5 [11] A method of manufacturing an electrode according to claim 10, further comprising a storing step of, after the active material containing layer forming step, sealing the obtained electrode into a case capable of storing the electrode in a closed state.

10 [12] A method of manufacturing an electrode according to claim 10 or 11, wherein all the manufacturing steps are performed in an inert gas atmosphere.

[13] A method of manufacturing a nonaqueous electrolyte battery comprising an anode, a cathode, and an electrolyte layer, arranged between the anode and cathode, including a nonaqueous electrolyte;

15 the method including an electrode forming step of forming at least one of the anode and cathode by way of the method of manufacturing an electrode according to one of claims 10 to 12.

20 [14] A method of manufacturing a nonaqueous electrolyte battery according to claim 13, wherein each of the anode and cathode is formed by way of the method of manufacturing an electrode according to one of claims 10 to 12.

[15] A method of manufacturing a nonaqueous electrolyte battery according to claim 13 or 14, wherein all the manufacturing steps are performed in an inert gas atmosphere.